

***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES***

Applicant: Patrick LENOIR
Title: APPLIANCE FOR CONNECTING A GAS-HEATED
RADIANT ELEMENT
Appl. No.: 10/591,536
Int'l Filing Date: 2/21/2005
371(c) Date: 11/13/2006
Examiner: Chuka Clement Ndubizu
Art Unit: 3743
Confirmation No.: 2986

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
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Sir:

Under the provisions of 37 C.F.R. § 41.37, this Appeal Brief is being filed together with a credit card payment form in the amount of \$540.00 covering the 37 C.F.R. 41.20(b)(2) appeal fee. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.

REAL PARTY IN INTEREST

The real parties in interest are: NV BEKAERT SA of Belgium and BEKAERT COMBUSTION TECHNOLOGY B.V. of the Netherlands.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 37-70 have been twice rejected, and all of which are the subject of this appeal. Claims 37, 46, and 57 are the independent claims.

Claims 1-36 have been canceled.

STATUS OF AMENDMENTS

No further amendments have been made in response to the Final Office Action dated April 12, 2010.

SUMMARY OF CLAIMED SUBJECT MATTER

The following is an explanation of the subject matter defined in each of the claims involved in the appeal. When possible, references are made to the specification by page and line number and to the drawings by reference characters for each of the claim features. However, it is noted that these references to the specification and drawings provide only examples of the present invention, and the scope of the claims is not limited to the text and figures provided in these references.

(1) Claim 37

The invention of claim 37 relates to an appliance (reference character 8 in Figs. 2-3; page 6, lines 11-15) for providing air and gas to a gas burner (reference character 2 in Fig. 1; page 5, line 28 to page 6, line 2) having a back tube for receiving air and gas to be combusted (reference character 13 in Figs. 2-4; page 6, lines 11-18), comprising:

an air tube (reference character 11 in Figs. 2 and 4; page 6, lines 11-15) comprising opposing first and second wall regions (reference characters 19 and 24, respectively, in Figs. 2 and 4; page 7, lines 9-11; page 8, lines 4-7) connected by longitudinal wall regions (vertical walls of wall 17 in Figs. 2 and 4) such that an inside space is enclosed by the first, second, and longitudinal wall regions (reference character 21 of Figs. 2 and 4; page 7, lines 12-13); and

a gas tube (reference character 10 in Figs. 2-4; page 6, lines 11-15) comprising an aperture for providing gas inwards to the air tube (reference character 39 in Figs. 2-4; page 10, lines 10-12),

wherein the air tube comprises a first aperture at the first wall region (reference character 18 in Figs. 2 and 4; page 7, lines 9-11) for receiving the back tube of the gas burner (reference character 13 in Figs. 2-4; page 7, lines 9-11) such that the back tube extends through the first aperture from outside the first wall region into the inside space (reference characters 13, 18, 19, and 21 in Figs. 2 and 4; page 7, lines 9-13), and

wherein the aperture of the gas tube is provided with a first part of a detachable connection device (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4), for receiving a second part of the detachable connection device provided on the back tube (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4) for allowing gas from the gas tube to enter the back tube.

(2) Claim 38

The invention of claim 38 provides that the aperture of the gas tube and the first aperture of the air tube are substantially aligned (reference character 18 and 39 in Figs. 2 and 4; page 4, lines 1-2).

(3) Claim 39

The invention of claim 39 provides that the detachable connection device is a quick connect coupling (reference characters 25 and 28 in Figs. 2-4; page 8, lines 21-25).

(4) Claim 40

The invention of claim 40 provides that the first part of the quick connect coupling constitutes a male tubular organ (reference character 28 in Figs. 2-4; page 9, line 11-12) for being received by a female sleeve (reference character 25 in Figs. 2-4; page 9, lines 11-12) from the second part of the quick connect coupling.

(5) Claim 41

The invention of claim 41 provides that the male tubular organ has on its external peripheral surface at least one annular groove opened outward (reference character 30 in Fig. 3; page 9, lines 5-6), the groove being adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(6) Claim 42

The invention of claim 42 provides that the first part of the quick connect coupling constitutes a female sleeve (reference character 25 in Figs. 2-4; page 8, line 28 to page 9, line 4) for receiving a male tubular organ (reference character 28 in Figs. 2-4; page 8, line 28 to page 9, line 4) from the second part of the quick connect coupling.

(7) Claim 43

The invention of claim 43 provides that the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior (reference character 27 in Fig. 3; page 8, line 28 to page 9, line 4), and wherein the groove is adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(8) Claim 44

The invention of claim 44 provides that the gas tube is located outside and adjacent to the air tube (reference character 10 in Figs. 2-4; page 8, lines 4-7), wherein the air tube comprises a second aperture at the second wall region (reference character 23 in Figs. 2-4; page 8, lines 4-7) for communicating with the aperture of the gas tube, and wherein the first part of the detachable connection device extends to the inside space of the air tube (reference characters 21, 25, and 28 in Figs. 2 and 4).

(9) Claim 45

The invention of claim 45 provides that the first part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first part and the second part of the detachable connection device (reference character 35 in Fig. 3; page 9, lines 11-12; page 10, lines 3-5).

(10) Claim 46

The invention of claim 46 relates to a gas burner (reference character 2 in Fig. 1; page 5, line 28 to page 6, line 2) for receiving air and gas to be combusted from an appliance (reference character 8 in Figs. 2-3; page 6, lines 11-15), the appliance comprising an air tube (reference character 11 in Figs. 2 and 4; page 6, lines 11-15) and a gas tube (reference character 10 in Figs. 2-4; page 6, lines 11-15) comprising an aperture for providing gas inwards to the air tube (reference character 39 in Figs. 2-4; page 10, lines 10-12), the gas burner comprising:

a radiant panel (reference character 14 in Fig. 2; page 6, lines 23-27); and
a back tube for providing air and gas to the radiant panel (reference character 13 in Figs. 2-4; page 6, lines 11-18),

wherein the back tube has an orifice for allowing air from the air tube to enter inside the back tube (reference character 20 in Figs. 2-4; page 7, lines 12-13),

wherein the air tube (reference character 11 in Figs. 2 and 4; page 6, lines 11-15) comprises opposing first and second wall regions (reference characters 19 and 24, respectively, in Figs. 2 and 4; page 7, lines 9-11; page 8, lines 4-7) connected by longitudinal wall regions (vertical walls of wall 17 in Figs. 2 and 4) such that an inside space is enclosed by the first, second, and longitudinal wall regions (reference character 21 of Figs. 2 and 4; page 7, lines 12-13), and a first aperture at the first wall region for receiving the back tube (reference character 18 in Figs. 2 and 4; page 7, lines 9-11) such that the back tube extends through the first aperture from outside the first wall region into the inside space (reference characters 13, 18, 19, and 21 in Figs. 2 and 4; page 7, lines 9-13), and

wherein the back tube is provided with a second part of a detachable connection device (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4) for receiving a first part of the detachable connection device present at the aperture of the gas tube (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4).

(11) Claim 47

The invention of claim 47 provides that the second part of the detachable connection device is adapted to pass through the first aperture of the air tube (reference character 25 in Figs. 2-4; page 8, lines 13-16; page 8, line 21 to page 9, line 4).

(12) Claim 48

The invention of claim 48 provides that the detachable connection device is a quick connect coupling (reference characters 25 and 28 in Figs. 2-4; page 8, lines 21-25).

(13) Claim 49

The invention of claim 49 provides that the second part of the quick connect coupling constitutes a male tubular organ (reference character 28 in Figs. 2-4; page 8, line 28 to page 9, line 4) for being received by a female sleeve of the first part of the quick connect coupling (reference character 25 in Figs. 2-4; page 8, line 28 to page 9, line 4).

(14) Claim 50

The invention of claim 50 provides that the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior (reference character 30 in Fig. 3; page 9, lines 5-6), and wherein the groove is adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(15) Claim 51

The invention of claim 51 provides that the back tube has at its back end (reference character 47 in Fig. 3; page 11, lines 3-10) a male tubular organ, wherein the male tubular organ comprises a piece of tube penetrating in the back end of the back tube (reference character 22 in Fig. 3; page 11, lines 3-13), and wherein the piece of tube constitutes an injector for injecting gas into the back tube (page 11, lines 11-13).

(16) Claim 52

The invention of claim 52 provides that the orifice is provided at a level of the injector (reference characters 20 and 22 in Fig. 3).

(17) Claim 53

The invention of claim 53 provides that the second part of the quick connect coupling constitutes a female sleeve (reference character 25 in Figs. 2-4; page 9, lines 11-12) for receiving a male tubular organ from the first part of the quick connect coupling (reference character 28 in Figs. 2-4; page 9, line 11-12).

(18) Claim 54

The invention of claim 54 provides that the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior (reference character 27 in Fig. 3; page 8, line 28 to page 9, line 4), and wherein the groove is adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(19) Claim 55

The invention of claim 55 provides that the second part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first and second parts of the detachable connection device (reference character 35 in Fig. 3; page 10, lines 3-5).

(20) Claim 56

The invention of claim 56 provides that the gas burner is an infrared radiant element (reference character 2 in Fig. 1; page 5, line 28 to page 6, line 2).

(21) Claim 57

The invention of claim 57 relates to a gas combustion device comprising:

at least one gas burner (reference character 2 in Fig. 1; page 5, line 28 to page 6, line 2) comprising a radiant panel (reference character 14 in Fig. 2; page 6, lines 23-27), and a back tube for receiving air and gas to be combusted and for providing air and gas to the radiant panel (reference character 13 in Figs. 2-4; page 6, lines 11-18); and

an appliance for providing air and gas to the gas burner (reference character 8 in Figs. 2-3; page 6, lines 11-15), wherein the appliance comprises an air tube (reference character 11 in Figs. 2 and 4; page 6, lines 11-15) and a gas tube (reference character 10 in Figs. 2-4; page 6, lines 11-15),

wherein the gas tube comprises an aperture for providing gas inwards to the air tube (reference character 39 in Figs. 2-4; page 10, lines 10-12),

wherein the air tube (reference character 11 in Figs. 2 and 4; page 6, lines 11-15) comprises opposing first and second wall regions (reference characters 19 and 24, respectively, in Figs. 2 and 4; page 7, lines 9-11; page 8, lines 4-7) connected by longitudinal wall regions (vertical walls of wall 17 in Figs. 2 and 4) such that an inside space is enclosed by the first, second, and longitudinal wall regions (reference character 21 of Figs. 2 and 4; page 7, lines 12-13), and a first aperture at the first wall region for receiving the back tube (reference character 18 in Figs. 2 and 4; page 7, lines 9-11) such that the back tube extends through the first aperture from outside the first wall region into the inside space (reference characters 13, 18, 19, and 21 in Figs. 2 and 4; page 7, lines 9-13),

wherein the back tube has an orifice for allowing air from the air tube to enter inside the back tube (reference character 20 in Figs. 2-4; page 7, lines 12-13), and

wherein the aperture of the gas tube is provided with a first part of a detachable connection device (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4), for receiving a second part of the detachable connection device provided on the back tube for

allowing gas from the gas tube to enter the back tube (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4).

(22) Claim 58

The invention of claim 58 provides that the aperture of the gas tube and the first aperture of the air tube are substantially aligned (reference character 18 and 39 in Figs. 2 and 4; page 4, lines 1-2).

(23) Claim 59

The invention of claim 59 provides that the detachable connection device is a quick connect coupling (reference characters 25 and 28 in Figs. 2-4; page 8, lines 21-25).

(24) Claim 60

The invention of claim 60 provides that one of the first and second parts of the quick connect coupling constitutes a male tubular organ, wherein the other of the first and second parts of the quick connect coupling constitutes a female sleeve, and wherein the male tubular organ is adapted for being received by the female sleeve (reference character 25 or 28 in Figs. 2-4; page 8, line 21 to page 9, line 4; page 9, lines 11-12).

(25) Claim 61

The invention of claim 61 provides that the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior (reference character 30 in Fig. 3; page 9, lines 5-6), and wherein the groove is adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(26) Claim 62

The invention of claim 62 provides that the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior (reference character 27 in Fig. 3; page 8, line 28 to page 9, line 4), and wherein the groove is adapted to receive an annular spring (reference character 32 in Fig. 3; page 9, lines 6-10).

(27) Claim 63

The invention of claim 63 provides that the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior (reference character 30 in Fig. 3; page 9, lines 5-6), and wherein the gas burner further comprises the annular

spring being received in the annular grooves of the male tubular organ and the female sleeve (reference character 32 in Fig. 3; page 9, lines 6-10).

(28) Claim 64

The invention of claim 64 provides that the second part of the quick connect coupling constitutes a male tubular organ (reference character 28 in Figs. 2-4; page 8, line 28 to page 9, line 4).

(29) Claim 65

The invention of claim 65 provides that the back tube has at its back end (reference character 47 in Fig. 3; page 11, lines 3-10) a male tubular organ, wherein the male tubular organ comprises a piece of tube penetrating in the back end of the back tube (reference character 22 in Fig. 3; page 11, lines 3-13), and wherein the piece of tube constitutes an injector for injecting gas into the back tube (page 11, lines 11-13).

(30) Claim 66

The invention of claim 66 provides that the orifice is provided at a level of the injector (reference characters 20 and 22 in Fig. 3).

(31) Claim 67

The invention of claim 67 provides that the gas tube is located outside and adjacent to the air tube (reference character 10 in Figs. 2-4; page 8, lines 4-7), wherein the air tube comprises a second aperture at the second wall region (reference character 23 in Figs. 2-4; page 8, lines 4-7) for communicating with the aperture of the gas tube, and wherein the first part of the detachable connection device extends to the inside space of the air tube (reference characters 21, 25, and 28 in Figs. 2 and 4).

(32) Claim 68

The invention of claim 68 provides that the first part and/or the second part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first and second parts of the detachable connection device (reference character 35 in Fig. 3; page 9, lines 11-12; page 10, lines 3-5).

(33) Claim 69

The invention of claim 69 provides that the second part of the detachable connection device is adapted to pass through the first aperture of the air tube (reference character 25 in Figs. 2-4; page 8, lines 13-16; page 8, line 21 to page 9, line 4).

(34) Claim 70

The invention of claim 70 provides that the gas burner is an infrared radiant element (reference character 2 in Fig. 1; page 5, line 28 to page 6, line 2).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection that are set forth in the Final Office Action are to be reviewed on appeal:

(1) the rejection of pending claims 37-70 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,665,950 (hereinafter, “Riepe”) and U.S. Patent No. 6,261,089 (hereinafter, “Aldo”).

ARGUMENTS

I. Claim 37 is allowable over Riepe and Aldo

A. Riepe and Aldo do not teach or suggest all the features of claim 37

The rejection of claim 37 should be withdrawn because Riepe and Aldo do not teach or suggest all the features of claim 37. For example, Riepe and Aldo does not teach or suggest an air tube comprising a first aperture at the first wall region for receiving the back tube of the gas burner such that the back tube extends through the first aperture from outside the first wall region into the inside space. As viewed in below FIG. 1, Riepe discloses a gas-heated infrared radiator with a manifold 13 used to supply gas 14, a hollow transverse beam 16 used to supply air 15, and a mixing tube 9 used to mix the gas 14 and the air 15. (Column 3, lines 22-45 of Riepe.) The gas/air mixture in the mixing tube 9 then impinges a baffle 10 in a distributing compartment 6 in order to distribute the gas/air mixture uniformly over the back face of the burner plate 5. (Column 3, lines 16-21 of Riepe.) A combustion compartment 7 is located downstream of the burner plate 5 where the gas/air mixture flowing through holes 8 in the burner plate 5 is burnt. (Column 3, lines 4-7 of Riepe.) A large portion

of the combustion energy is then transmitted convectively to solid bodies that give it up as infrared radiation on the front side of the radiator. (Column 3, lines 7-9 of Riepe.)

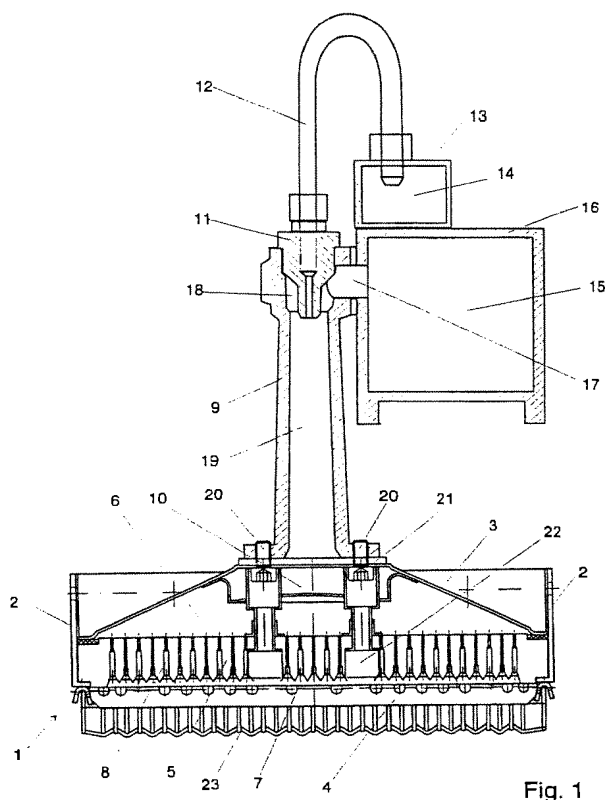


FIG. 1: ASSEMBLY OF RIEPE

In the Final Office Action dated April 12, 2010 (hereinafter, “the Final Office Action”), the Examiner considers the manifold 13 of Riepe to be the gas tube of claim 37, the hollow transverse beam 16 of Riepe to be the air tube of claim 37, and the mixing tube 9 of Riepe to be the back tube of claim 37. (Pages 2-3 of the Final Office Action.) However, the transverse beam 16 and the mixing tube 9 of Riepe cannot be the air tube and back tube, respectively, of claim 37 because the transverse beam 16 of Riepe does not have a first aperture at the first wall region for receiving the mixing tube 9 such that the mixing tube 9 extends through the first aperture from outside the first wall region into the inside space. Accordingly, Riepe does not disclose a back tube passing into the air tube (which has the advantage of cooling the back tube) or an air tube having an aperture for receiving the back tube. Because Riepe does not teach or suggest the back tube and air tube of claim 37, Riepe necessarily does not teach or suggest that an aperture of the gas tube provided with a first part

of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube. Thus, Riepe not disclose all the features of claim 37.

Aldo does not cure the deficiencies of Riepe because Aldo does not teach or suggest the air tube and back tube of claim 37. As shown in the below FIGS. 2 and 3, Aldo discloses a plurality of burner units 1 with slits where the flame develops. (Column 2, lines 19-24 of Aldo.) Each burner unit has its own Venturi tube 3 for collecting the necessary fuel gas and air. (Column 2, lines 25-28 of Aldo.) The fuel gas from a collector 5 is fed into the Venturi tube 3 via a nozzle 4. (Column 2, lines 25-28 of Aldo.) A fan 6 works constantly to permit air into a collector 7, followed by the air exiting through holes located near the nozzles 4. (Column 2, lines 29-32 of Aldo.) Fig. 9 of Aldo upon which the Examiner relies upon in the rejection (and which is shown in the below FIG. 3) shows an arrangement of the collector 5 and the collector 7 according to one of the embodiments disclosed by Aldo. (Column 2, line 66 to column 3, line 4 of Aldo.)

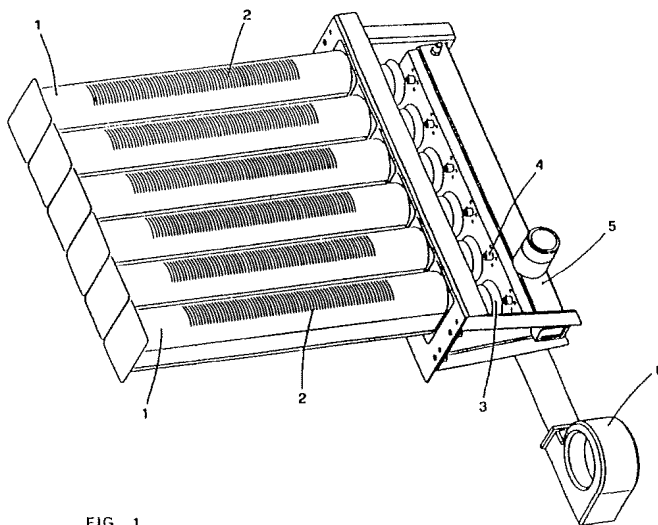
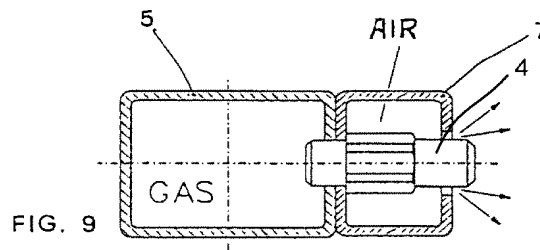


FIG. 1

FIG. 2: ASSEMBLY OF ALDO



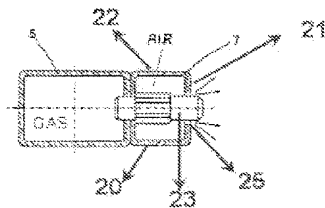
**FIG. 3: NOZZLE OF ALDO RELIED UPON BY EXAMINER
(modified to include reference numeral 4)**

In the Final Office Action, the Examiner contends that the collector 7 is equated with the air tube of claim 37, the collector 5 is equated with the gas tube of claim 37, and the nozzle 4 (which the Examiner labels with reference character 23 in the Final Office Action) is equated with the back tube of claim 37. (Pages 3-4 of the Final Office Action.). However, the collector 5 of Aldo cannot be equated with the gas tube of claim 37 because the collector 5 does not have an aperture of the gas tube with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the nozzle 4 for allowing gas from the gas tube to enter the back tube. Because the collector 5 of Aldo cannot be equated with the gas tube of claim 37 and (as previously mentioned) Riepe does not teach or suggest the gas tube of claim 37, and the combination of Riepe and Aldo fails to disclose the gas tube of claim 37. Thus, claim 37 is allowable over Riepe and Aldo.

B. One of ordinary skill in the art would not combine Riepe and Aldo to arrive at the invention of claim 37

The rejection of claim 37 should be withdrawn because one of ordinary skill in the art would not combine the teachings of Riepe and Aldo, as suggested by the Examiner, to arrive at the invention of claim 37. As previously discussed in section I.A of the Arguments section (which is incorporated by reference herein), Riepe does not teach or suggest an air tube comprising a first aperture at the first wall region for receiving a back tube of the gas burner such that the back tube extends through the first aperture from outside the first wall region into the inside space. As a consequence, Riepe also does not teach or suggest an aperture of the gas tube provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube. Recognizing this deficiency, on pages 3-4 of the Final Office Action, the Examiner asserts:

With regard to claims 37, 46 and 57 Aldo teaches a gas burner comprising an air tube 7 comprising opposing first 21 and second (opposite 21) wall regions connected by longitudinal wall regions 20 and 22 such that an inside space is enclosed by the first, second, and longitudinal wall regions (see fig below); an aperture on the gas tube 5 and on the air tube wall opposite 21 for providing gas inwards to the air tube (see fig below), wherein the air tube comprises a first aperture 25 at the first wall region for receiving the back tube 23 of the gas burner such that the back tube extends through the first aperture 25 from outside the first wall region into the inside space (see below).



It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Riepe's appliance by having part of the back tube enclosed by the air tube in order to provide an appliance that is compact where the air in the air tube bathes the back tube and cools it. This also helps preheat the combustion air and this would lead to enhanced burner efficiency.

Aldo does not cure the deficiencies of Riepe because there is no reason for one of ordinary skill in the art to modify the assembly of Riepe using the teachings of Aldo as suggested by the Examiner.

- (a) There is no reason to combine Riepe and Aldo because the function of the nozzle of Aldo needs to change in the modification

The combination of Riepe and Aldo is improper because the function of the nozzle of Aldo needs to change in the modification. In particular, for the Examiner's rejection to have any merit, one of ordinary skill in the art would need to have a reason to think that the nozzle 4 of Aldo would somehow be incorporated into the assembly of Riepe without the benefit of the Applicant's disclosure. However, the nozzle 4 of Aldo is not sufficiently similar in structure or in function as the mixing tube 9 of Riepe such that one of ordinary skill in the art would not equate these two elements as equivalent.

For example and as previously mentioned, the mixing tube 9 of Riepe is in fluid communication with a gas collector 14 via a gas nozzle 11, a gas-supply line 12, and a

manifold 13 and with an air collector 15 via a connecting conduit 17 such that a mixing compartment 19 of the mixing tube 9 is filled from the top with a gas/air mixture. (Column 3, lines 22-32 of Riepe.) The gas/air mixture flows out of the mixing tube 9 and impinges a baffle 10 to distribute the gas/air mixture uniformly over the back face of the burner plate 5. (Column 3, lines 16-21 of Riepe.) Downstream in the flow direction from the burner plate 5 is a combustion compartment 7 in which the gas/air mixture flowing through holes 8 in the burner plate 5 is burnt. (Column 3, lines 1-9 of Riepe.) Thus, the purpose of the mixing tube 9 of Riepe is to collect air and fuel gas for mixing and channeling into the radiator housing 1. In contrast, the nozzle 4 of Aldo is in fluid communication with a fuel gas collector 5, which injects the fuel gas into the Venturi tube 3. The nozzle 4 of Aldo has no other inlet. Thus, the nozzle 4 of Aldo is not connected so as to mix air with the fuel gas within the nozzle 4 in a manner like that of the mixing tube 9 of Riepe. Indeed, the Venturi tube 3 of Aldo is the place in which the air and fuel gas are mixed. (Column 1, lines 54-58 of Aldo.)

To be able to equate the nozzle 4 of Aldo with the mixing tube 9 of Riepe, one of ordinary skill in the art essentially needs to view the nozzle 4 of Aldo as performing a different function (a mixing function) from its disclosed function in Aldo (a gas-directing function). Because the rejection requires that the nozzle 4 of Aldo be seen as performing a different function, the proposed combination is improper. Specifically, MPEP 2143 provides that a rejection based on a rationale of combining prior art elements according to known methods to yield predictable results cannot be maintained if each element in the combination does not merely perform the same function as it does separately. Because the rationale for making the proposed modification is predicated on the function of the nozzle of Aldo being changed to a mixing function (so that the nozzle 4 of Aldo can be equated with the mixing tube 9 of Riepe), the modification based on such an analysis would not have been obvious and a rejection based on the modification is improper. Thus, claim 37 is allowable over Riepe and Aldo.

- (b) There is no reason to combine Riepe and Aldo because the structure of the nozzle of Aldo is not equated with the mixing tube of Riepe

The combination of Riepe and Aldo is improper because the structure of the nozzle of Aldo cannot not equated with the structure of the mixing tube of Riepe. One of ordinary skill in the art would not understand the mixing tube 9 of Riepe and the nozzle 4 of Aldo to be

equated with each other in structural terms. The mixing tube 9 of Riepe has essentially two inlets (one connected to the conduit 17 for the air and one connected to the supply line 12 for the gas) and one outlet. In contrast, the nozzle 4 of Aldo has one inlet and one outlet to channel one gas into a mixing chamber. Further, one of ordinary skill in the art would view the nozzle 4 of Aldo to be considerably smaller than the mixing tube 9 of Riepe given their respective functions and their respective relationships to the components to which they connect. How would one of ordinary skill in the art be able to view two such different components as being sufficiently similar in structure so as to be equated to be the same? To be able to equate the nozzle 4 of Aldo with the mixing tube of Riepe would involve modifying the nozzle 4 of Aldo to a point so that it can be at least structurally similar to the mixing tube of Riepe so as to equate the nozzle of Aldo with the mixing tube of Riepe. Absent Applicant's disclosure, there is no disclosure or reason to make such a modification to the nozzle 4 of Aldo. Indeed, one of ordinary skill in the art would not make such a modification given its function and relationship to the components to which it is attached in the assembly of Aldo. Because the nozzle 4 of Aldo is so different in terms of size and its relationship to its adjacent components from the mixing tube 9 of Riepe, the incorporation of the nozzle of Aldo in the assembly of Riepe would require further modification, which would not have been obvious to one of ordinary skill in the art. Thus, the rejection based on Riepe and Aldo is improper, and should be withdrawn. Accordingly, claim 37 is allowable over Riepe and Aldo.

(c) The reasons for the alleged combination proposed by the Examiner are insufficient

The combination of Riepe and Aldo is improper because the Examiner's reasons for the alleged combination are insufficient. The Examiner asserts that one of the reasons for modifying the assembly of Riepe by having part of the mixing tube 9 enclosed by the transverse beam 16 is "in order to provide an appliance that is compact where the air in the air tube bathes the back tube and cools it." (Page 4 of the Final Office Action.) The Examiner also asserts that "[t]his also helps preheat the combustion air and this would lead to enhanced burner efficiency." (Page 4 of the Final Office Action.) These alleged reasons are not supported by Riepe, Aldo, or any evidence.

For example, there is no evidence that the gas/air mixture in the mixing tube 9 of Riepe is even heated. Combustion of the gas/air mixture takes place in the combustion compartment 7 located downstream of the burner plate 5 where the gas/air mixture flowing through holes 8. There is nothing to support the assertion that the air 15 in the transverse beam 16 is so much cooler that the air 15 has the ability to cool the mixing tube 9 or that the gas/air mixture in the mixing tube 19 is so much hotter that gas/air mixture has the ability to heat the air 15 in the transverse beam 16. Indeed, the arrangement of the assembly of Riepe suggests the opposite since the gas/air mixture becomes “heated” (more particularly, is combusted) after it leaves the mixing tube 9. Because the gas/air mixture is not heated or combusted in the mixing tube 9, there is nothing to teach or suggest that the mixing tube 9 of Riepe is heated in any significant way to lead one of ordinary skill in the art to believe the mixing tube 9 can be cooled by the air 15 from the transverse beam 16 or that the gas/air mixture can heat the air 15 in the transverse beam 16. Thus, the Examiner’s reasons for the proposed modification (to heat the air 15 in the transverse beam 16 or to cool the mixing tube 9) are not supported by the Riepe, Aldo, or any evidence and may run contrary to the teachings of Riepe.

Because the reasons proposed by the Examiner for the combination of Riepe and Aldo are not supported and are improper, the rejection based on Riepe and Aldo is improper. Accordingly, claim 37 is allowable over Riepe and Aldo.

(d) If Riepe and Aldo were combined, it would not result in the invention of claim 37

The combination of Riepe and Aldo is improper because it would not result in the invention of claim 37. Even if one of ordinary skill in the art would consider the teachings of Aldo applicable to the teachings of Riepe (which the Applicant does not concede), one of ordinary skill in the art, at best, would merely replace the gas nozzle 11 of Riepe with the nozzle 4 of Aldo because the gas nozzle 11 of Riepe and the nozzle 4 at least perform similar functions. Thus, the combination would merely result in the nozzle 4 of Aldo merely be placed into the mixing tube 9 of Riepe. The combination would not result in the mixing tube 9 of Riepe extending into the traverse beam 16 of Riepe. Because the combination of Riepe and Aldo would not result in an air tube comprising a first aperture at the first wall region for receiving a back tube of the gas burner such that the back tube extends through the first

aperture from outside the first wall region into the inside space, and an aperture of the gas tube provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube. Thus, claim 37 is allowable over Riepe and Aldo.

(e) There is no reason to combine Riepe and Aldo because the principle of operation of the assembly of Riepe would be changed

The combination of Riepe and Aldo is improper because the principle of operation of the assembly of Riepe would be changed. MPEP 4143.01 provides “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).” In this case, one of ordinary skill in the art would not consider the teachings of Aldo compatible with the teachings of Riepe because Aldo does not describe a burner with a radiant panel but a burner made of metal plate material with slits. Also, the air tube 7 in the Aldo burner is not providing all the air needed for a proper combustion, but only supplies “approximately an amount of air in the range from 1 to 30% the total air to be let into the Venturi tube” (column 2, lines 33-35 of Aldo), as opposed to the transverse beam 16 providing all of the air in the assembly of Riepe. Thus, the two assemblies work on different principles of operation and are not applicable to each. Given the very different configurations of the burners (e.g., the location of the combustion, the channeling of fuel gas and air, the form of heat provided, etc.), an attempt to incorporate the gas/air supply system of Aldo into the gas/air system of Riepe would essentially change the principle of operation of the assembly of Riepe, which makes such a modification non-obvious. Because the combination of Riepe and Aldo is improper, the rejection based on such a combination is improper, and claim 37 is allowable over Riepe and Aldo.

(f) There is no reason to combine Riepe and Aldo because the assembly of Riepe would become inoperative

The combination of Riepe and Aldo is improper because the assembly of Riepe would become inoperative if modified as suggested by the Examiner. MPEP 2143.01 provides “[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed

modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).” In this case, the collector 7 of Aldo is not in fluid communication with the nozzle 4. If the configuration of the collector 7 and the nozzle 4 of Aldo is used as the configuration of the transverse beam 16 and the mixing tube 9 of Riepe, respectively, the resulting combination would not have air from the transverse beam 16 entering into the mixing tube 9 of Riepe. If no air is supplied to the mixing tube 9 of Riepe, the radiator of Riepe would be inoperable.

The Examiner alleges that “[t]he only teaching borrowed from Aldo is to have the air tube enclose part of the back tube including the holes.” (Page 9 of the Final Office Action.) The Examiner is “cherry-picking” only those portions of Aldo that supports his combination and disregards those portions of Aldo that would discourage his combination, which is improper. MPEP 2141.02 provides “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).” It is impermissible to rely upon the collector 7 of Aldo surrounding the nozzle 4 and then assert “the teaching of ‘nozzle 4’ was not borrowed.” (Page 9 of the Office Action.) The collectors 5 and 7 and nozzle 4 are intricately linked to carry out a function of providing air and gas downstream of the collectors and nozzle. To use the collector 7 of Aldo without the nozzle 4 is contrary to the very teachings of Aldo, and one of ordinary skill in the art simply would not view the collector 7 without the nozzle 4 of Aldo to which it surrounds. Accordingly, the use of the collector 7 of Aldo would not be separated from the use of the nozzle 4 of Aldo, and one of ordinary skill in the art would not use the nozzle 4 of Aldo as the mixing tube 9 of Riepe because it would make the assembly of Riepe inoperative. Accordingly, the rejection based on the combination of Riepe and Aldo is improper, and should be withdrawn. Thus, claim 37 is allowable over Riepe and Aldo.

For at least all these reasons, claim 37 is allowable over Riepe and Aldo.

II. Riepe and Aldo do not disclose the features of claims 38-40 and 42-45

Claims 38-40 and 42-45 depend from and contain all the features of claim 37, and are allowable for at least the same reasons as provided in sections I.A and I.B of the Arguments section provided above, which are incorporated herein by reference. Thus, claims 38-40 and 42-45 are allowable over Riepe and Aldo.

III. Riepe and Aldo do not teach or suggest the features of claim 41

Claim 41 depends from and contains all the features of claim 37, and is allowable for at least the same reasons as provided in sections I.A and I.B of the Arguments section provided above, which are incorporated herein by reference.

Also, claim 41 recites “wherein the male tubular organ has on its external peripheral surface at least one annular groove opened outward, the groove being adapted to receive an annular spring.” Neither Riepe nor Aldo teaches or suggests this feature. The Examiner merely relies upon “a mere rearrangement of parts” rationale and Applicant’s own disclosure that the position between the male tubular organ and the female sleeve can be reversed for rejecting claim 40. (Pages 4-5 of the Final Office Action.)

As to the mere rearrangement of parts, a rejection based on this rationale is improper because no prior art has been set forth teaching or suggesting all the features of claim 41. The Supreme Court in *KSR Int’l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727 (2007) has not removed the requirement that the prior art reference (or references when combined) must teach or suggest all the claim limitations. Indeed, *KSR* emphasized cases where all features are known. Furthermore, the exemplary rationales listed in MPEP 2143 suggests that all elements (when the references are combined) need to be known in the art to support a conclusion of obviousness. Thus, the Examiner is not relieved of his responsibility of finding prior art teaching or suggesting all the features of the claimed invention to establish a prima facie case of obviousness. The assertion that the Applicant’s invention amounts to a mere rearrangement of parts is no substitute for finding prior art for establishing the claimed quick connect coupling with the male tubular organ, its groove, and an annular spring received in the groove in the prior art along with the other features of claim 41.

Furthermore, the arranging of the connection of the mixing tube 9 and the gas supply line 12 of Riepe would change how the supply line 12 and the mixing tube interact with each other. For example, where would the groove and annular spring be placed? What would the connection look like with its latch element on one side and the transverse beam 16 on the other? How do these components interact with each other? The answers to these considerations are not obvious to one of ordinary skill in the art, and claim 41 is allowable over Riepe and Aldo.

Also, the reliance upon Applicant's own disclosure for rejecting claim 41 is hindsight in the classic sense, which is improper. A claim is considered to be anticipated or obvious to one of ordinary skill in the art when the prior art teaches or suggests the claimed invention absent Applicant's disclosure. A rejection is improper if it includes knowledge gleaned from applicant's disclosure. (See MPEP 2142.¹) Because the Examiner relied upon Applicant's own disclosure for rejecting claim 41, the rejection of claim 41 is improper, and claim 41 is allowable over Riepe and Aldo.

For at least these reasons, claim 41 is allowable over Riepe and Aldo.

IV. Claim 46 is allowable over Riepe and Aldo

A. Riepe and Aldo do not teach or suggest all the features of claim 46

The rejection of claim 46 should be withdrawn because Riepe and Aldo do not teach or suggest all the features of claim 46. For example and as previously mentioned in section I.A of the Arguments section provided above (which is incorporated by reference in its entirety herein), Riepe and Aldo do not teach or suggest an air tube comprising a first aperture at the first wall region for receiving the back tube such that the back tube extends through the first aperture from outside the first wall region into the inside space and an aperture of the gas tube provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube. Because Riepe and Aldo lack these features, claim 46 is allowable over Riepe and Aldo.

B. One of ordinary skill in the art would not combine Riepe and Aldo to arrive at the invention of claim 46

The rejection of claim 46 should be withdrawn because one of ordinary skill in the art would not combine the teachings of Riepe and Aldo, as suggested by the Examiner, to arrive at the invention of claim 46 for the same reasons as outlined in section I.B of the Arguments section and its subsections (a)-(f) above (which is incorporated by reference in its entirety herein). Thus, claim 46 is allowable over Riepe and Aldo.

¹ "[I]mpermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art."

V. Riepe and Aldo do not disclose the features of claims 47-49 and 51-56

Claims 47-49 and 51-56 depend from and contain all the features of claim 46, and are allowable for at least the same reasons as provided in sections I.A, I.B, IV.A, and IV.B of the Arguments section provided above, which are incorporated herein by reference. Thus, claims 47-49 and 51-56 are allowable over Riepe and Aldo.

VI. Riepe and Aldo do not teach or suggest the features of claim 50

Claim 50 depends from and contains all the features of claim 46, and is allowable for at least the same reasons as provided in sections I.A, I.B, IV.A, and IV.B of the Arguments section provided above, which are incorporated herein by reference.

Also, claim 50 recites “wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the groove is adapted to receive an annular spring.” Neither Riepe nor Aldo teaches or suggests this feature for the same reasons as outlined in section III of the Arguments section above (which is incorporated by reference in its entirety herein).

For at least these reasons, claim 50 is allowable over Riepe and Aldo.

VII. Claim 57 is allowable over Riepe and Aldo

A. Riepe and Aldo do not teach or suggest all the features of claim 57

The rejection of claim 57 should be withdrawn because Riepe and Aldo do not teach or suggest all the features of claim 57. For example and as previously mentioned in section I.A of the Arguments section provided above (which is incorporated by reference in its entirety herein), Riepe and Aldo do not teach or suggest an air tube comprising a first aperture at the first wall region for receiving the back tube such that the back tube extends through the first aperture from outside the first wall region into the inside space and that the aperture of the gas tube is provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube. Because Riepe and Aldo lack these features, claim 57 is allowable over Riepe and Aldo.

B. *One of ordinary skill in the art would not combine Riepe and Aldo to arrive at the invention of claim 57*

The rejection of claim 57 should be withdrawn because one of ordinary skill in the art would not combine the teachings of Riepe and Aldo, as suggested by the Examiner, to arrive at the invention of claim 57 for the same reasons as outlined in section I.B of the Arguments section and its subsections (a)-(f)) above (which is incorporated by reference in its entirety herein). Thus, claim 57 is allowable over Riepe and Aldo.

VIII. Riepe and Aldo do not disclose the features of claims 58-60, 62, and 64-70

Claims 58-60, 62, and 64-70 depend from and contain all the features of claim 57, and are allowable for at least the same reasons as provided in sections I.A, I.B, VII.A, and VII.B of the Arguments section provided above, which are incorporated herein by reference. Thus, claims 58-60, 62, and 64-70 are allowable over Riepe and Aldo.

IX. Riepe and Aldo do not teach or suggest the features of claim 61

Claim 61 depends from and contains all the features of claim 57, and is allowable for at least the same reasons as provided in sections I.A, I.B, VII.A, and VII.B of the Arguments section provided above, which are incorporated herein by reference.

Also, claim 61 recites “wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the groove is adapted to receive an annular spring.” Neither Riepe nor Aldo teaches or suggests this feature for the same reasons as outlined in section III of the Arguments section above (which is incorporated by reference in its entirety herein).

For at least these reasons, claim 61 is allowable over Riepe and Aldo.

X. Riepe and Aldo do not teach or suggest the features of claim 63

Claim 63 depends from and contains all the features of claim 57, and is allowable for at least the same reasons as provided in sections I.A, I.B, VII.A, and VII.B of the Arguments section provided above, which are incorporated herein by reference.

Also, claim 63 recites “wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the gas burner further comprises the annular spring being received in the annular grooves of the male tubular

organ and the female sleeve.” Neither Riepe nor Aldo teaches or suggests this feature. The Examiner merely relies upon “a mere rearrangement of parts” rationale citing *In re Japikse* and “a matter of duplication of parts” citing *In re Harza* for rejecting claim 63. (Pages 7-8 of the Final Office Action.)

Both rationales are improper bases for rejecting claim 63 because no prior art has been set forth teaching or suggesting all the features of claim 63. The Supreme Court in *KSR* has not removed the requirement that the prior art reference (or references when combined) must teach or suggest all the claim limitations, and the exemplary rationales listed in MPEP 2143 suggests that all elements (when the references are combined) need to be known in the art to support a conclusion of obviousness. The assertions that the Applicant’s invention amounts to a mere rearrangement of parts or mere duplication of parts is no substitute for finding prior art for establishing the claimed male tubular organ, groove, and annular spring in the prior art along with the other features of claim 63.

Furthermore, the arranging of the connection of the mixing tube 9 and the gas supply line 12 of Riepe would change how the supply line 12 and the mixing tube interact with each other. For example, where would the groove and annular spring be placed? What would the connection look like with its latch element on one side and the transverse beam 16 on the other? How do these components interact with each other? The answers to these considerations are not obvious to one of ordinary skill in the art.

Additionally, the reliance upon the rationales of a mere rearrangement of parts and a mere duplication of parts has been held to be insufficient grounds for rejection by the Board of Patent Appeals and Interferences. For example, in *Ex Parte Makutonin*, the Board explicitly stated, in overturning a rejection where an examiner relied upon the rationales of a mere rearrangement of parts (in which the Examiner cited *St. Regis Paper Co. v. Bemis Co.* (193 USPQ 8)) and a mere duplication of parts (in which the Examiner cited *In re Japikse*), that rejections

based on 35 U.S.C. § 103(a) must rest on a factual basis. *In re Warner*. 379 F.2d 1011, 1017, 154 USPQ 173, 177-78 (CCPA 1967). In making such a rejection, the examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. *Id.*

In the present case, the examiner fails to advance any factual basis to supply the admitted deficiencies of Scarpa vis-a-vis the subject matter recited in independent claims 1, 16, 24, 35 and 36. Instead, the examiner attempts to bridge Scarpa's evidentiary gaps by resort to so-called mechanical or per se rules of obviousness allegedly established by the St. Regis and Japikse cases. Such rules do not exist, however, and the reliance thereon by the examiner to establish obviousness under § 103(a) is improper. See *In re Ochiai*, 71 F.3d 1565, 1570, 37 USPQ2d 1127, 1132 (Fed. Cir. 1995)...
(*Ex Parte Boris E. Makutonin*, Appeal No. 2002-1058, Application 09/228,856 (2003 WL 23014547 (Bd. Pat. App. & Interf.) - emphasis added).

It is respectfully submitted that the scenario detailed in *Ex Parte Makutonin*, as it relates to the examination of the present application, is strikingly similar, if not the same as the present case: "the Examiner fails to advance any factual basis to supply the admitted deficiencies of [Riepe and Aldo] vis-à-vis the subject matter recited in [claim 63]." The Examiner relied upon improper bases for the rejection of claim 63, claim 63 is allowable over Riepe and Aldo.

For at least these reasons, claim 63 is allowable over Riepe and Aldo.


CONCLUSION

Applicant believes that the claims are allowable over the prior art, and reversal of the rejections is respectfully requested.

Respectfully submitted,

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CLAIMS APPENDIX

37. An appliance for providing air and gas to a gas burner having a back tube for receiving air and gas to be combusted, comprising:

an air tube comprising opposing first and second wall regions connected by longitudinal wall regions such that an inside space is enclosed by the first, second, and longitudinal wall regions; and

a gas tube comprising an aperture for providing gas inwards to the air tube,

wherein the air tube comprises a first aperture at the first wall region for receiving the back tube of the gas burner such that the back tube extends through the first aperture from outside the first wall region into the inside space, and

wherein the aperture of the gas tube is provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube.

38. The appliance as claimed in claim 37, wherein the aperture of the gas tube and the first aperture of the air tube are substantially aligned.

39. The appliance as claimed in claim 37, wherein the detachable connection device is a quick connect coupling.

40. The appliance as claimed in claim 39, wherein the first part of the quick connect coupling constitutes a male tubular organ for being received by a female sleeve from the second part of the quick connect coupling.

41. The appliance as claimed in claim 40, wherein the male tubular organ has on its external peripheral surface at least one annular groove opened outward, the groove being adapted to receive an annular spring.

42. The appliance as claimed in claim 39, wherein the first part of the quick connect coupling constitutes a female sleeve for receiving a male tubular organ from the second part of the quick connect coupling.

43. The appliance as claimed in claim 42, wherein the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior, and wherein the groove is adapted to receive an annular spring.

44. The appliance as claimed in claim 37, wherein the gas tube is located outside and adjacent to the air tube, wherein the air tube comprises a second aperture at the second wall region for communicating with the aperture of the gas tube, and wherein the first part of the detachable connection device extends to the inside space of the air tube.

45. The appliance as claimed in claim 37, wherein the first part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first part and the second part of the detachable connection device.

46. A gas burner for receiving air and gas to be combusted from an appliance, the appliance comprising an air tube and a gas tube comprising an aperture for providing gas inwards to the air tube, the gas burner comprising:

a radiant panel; and

a back tube for providing air and gas to the radiant panel,

wherein the back tube has an orifice for allowing air from the air tube to enter inside the back tube,

wherein the air tube comprises opposing first and second wall regions connected by longitudinal wall regions such that an inside space is enclosed by the first, second, and longitudinal wall regions, and a first aperture at the first wall region for receiving the back tube such that the back tube extends through the first aperture from outside the first wall region into the inside space, and

wherein the back tube is provided with a second part of a detachable connection device for receiving a first part of the detachable connection device present at the aperture of the gas tube.

47. The gas burner as claimed in claim 46, wherein the second part of the detachable connection device is adapted to pass through the first aperture of the air tube.

48. The gas burner as claimed in claim 46, wherein the detachable connection device is a quick connect coupling.

49. The gas burner as claimed in claim 48, wherein the second part of the quick connect coupling constitutes a male tubular organ for being received by a female sleeve of the first part of the quick connect coupling.

50. The gas burner as claimed in claim 49, wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the groove is adapted to receive an annular spring.

51. The gas burner as claimed in claim 48, wherein the back tube has at its back end a male tubular organ, wherein the male tubular organ comprises a piece of tube penetrating in the back end of the back tube, and wherein the piece of tube constitutes an injector for injecting gas into the back tube.

52. The gas burner as claimed in claim 51, wherein the orifice is provided at a level of the injector.

53. The gas burner as claimed in claim 48, wherein the second part of the quick connect coupling constitutes a female sleeve for receiving a male tubular organ from the first part of the quick connect coupling.

54. The gas burner as claimed in claim 53, wherein the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior, and wherein the groove is adapted to receive an annular spring.

55. The gas burner as claimed in claim 46, wherein the second part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first and second parts of the detachable connection device.

56. The gas burner as claimed in claim 46, wherein the gas burner is an infrared radiant element.

57. A gas combustion device comprising:

at least one gas burner comprising a radiant panel, and a back tube for receiving air and gas to be combusted and for providing air and gas to the radiant panel; and

an appliance for providing air and gas to the gas burner, wherein the appliance comprises an air tube and a gas tube,

wherein the gas tube comprises an aperture for providing gas inwards to the air tube,

wherein the air tube comprises opposing first and second wall regions connected by longitudinal wall regions such that an inside space is enclosed by the first, second, and longitudinal wall regions, and a first aperture at the first wall region for receiving the back tube such that the back tube extends through the first aperture from outside the first wall region into the inside space,

wherein the back tube has an orifice for allowing air from the air tube to enter inside the back tube, and

wherein the aperture of the gas tube is provided with a first part of a detachable connection device, for receiving a second part of the detachable connection device provided on the back tube for allowing gas from the gas tube to enter the back tube.

58. The gas combustion device as claimed in claim 57, wherein the aperture of the gas tube and the first aperture of the air tube are substantially aligned.

59. The gas combustion device as claimed in claim 57, wherein the detachable connection device is a quick connect coupling.

60. The gas combustion device as claimed in claim 59, wherein one of the first and second parts of the quick connect coupling constitutes a male tubular organ, wherein the other of the first and second parts of the quick connect coupling constitutes a female sleeve, and wherein the male tubular organ is adapted for being received by the female sleeve.

61. The gas combustion device as claimed in claim 60, wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the groove is adapted to receive an annular spring.

62. The gas combustion device as claimed in claim 60, wherein the female sleeve has in its internal peripheral surface at least one annular groove opened towards its interior, and wherein the groove is adapted to receive an annular spring.

63. The gas combustion device as claimed in claim 62, wherein the male tubular organ has on its external peripheral surface at least one annular groove opened towards its exterior, and wherein the gas burner further comprises the annular spring being received in the annular grooves of the male tubular organ and the female sleeve.

64. The gas combustion device as claimed in claim 59, wherein the second part of the quick connect coupling constitutes a male tubular organ.

65. The gas combustion device as claimed in claim 59, wherein the back tube has at its back end a male tubular organ, wherein the male tubular organ comprises a piece of tube penetrating in the back end of the back tube, and wherein the piece of tube constitutes an injector for injecting gas into the back tube.

66. The gas combustion device as claimed in claim 65, wherein the orifice is provided at a level of the injector.

67. The gas combustion device as claimed in claim 57, wherein the gas tube is located outside and adjacent to the air tube, wherein the air tube comprises a second aperture at the second wall region for communicating with the aperture of the gas tube, and wherein the first part of the detachable connection device extends to the inside space of the air tube.

68. The gas combustion device as claimed in claim 57, wherein the first part and/or the second part of the detachable connection device is provided with at least one sealing gasket for providing a gas-tight coupling between the first and second parts of the detachable connection device.

69. The gas combustion device as claimed in claim 57, wherein the second part of the detachable connection device is adapted to pass through the first aperture of the air tube.

70. The gas combustion device as claimed in claim 57, wherein the gas burner is an infrared radiant element.

EVIDENCE APPENDIX

-NONE-

RELATED PROCEEDINGS APPENDIX

-NONE-